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ENTERO-COLITIS,

(SUMMER DIARRHŒA OF CHILDREN.)

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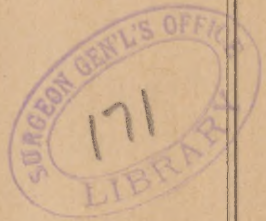
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ENTERO-COLITIS.

(SUMMER DIARRHŒA.)

BY

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To the Nashville Academy of Medicine and Surgery :

Enterocolitis, or inflammatory diarrhœa, presents as defined, febrile reaction during part of its course, constitutional disturbance, mucous, muco-purulent and muco-sanguineous stools, and upon autopsies, shows tissue changes in the small and large bowels, regarded as evidence of inflammation of their mucous membrane. I shall consider cholera infantum as an aggravated form of this disease, since upon the authority of Barthez, Rilliet, West, Meigs, Pepper and J. Lewis Smith, the lesions of the bowels usually characterizing it are, as Meigs says, "precisely those of enterocolitis," and that the two diseases, together with simple diarrhœa and some forms of dysentery, are so leagued together in their causation, much of their symptomatology, anatomical changes and treatment, that they might almost be regarded as different forms, stages or expressions of a single disease. I shall confine my consideration of these disorders of the alimentary tube, as occurring in children under five years of age during the heated seasons of the year.

Says West, they depend upon the same cause, and to a notable extent are amenable to like remedies.

Of 2,129 cases coming under the observation of this author, there is shown that the age of the child determines, in a large measure, the occurrence of the malady. That 58 per cent. occurred in children before the close of the second year. Between six and twelve months, 15.7 per cent.; between twelve and eighteen, 20 per cent.; and from eighteen months to two years, 13.9 per cent., gradually diminishing, till from ten to fifteen years of age only 4 per cent. occurred.



As you perceive, the most of these cases occurred during that period when the evolutions of dentition were most active. This fact has lead many to suppose that the diarrhoea was owing to a sympathy between the bowels and irritated gums, on the approach of the irruption of the teeth. Inasmuch as attacks of diarrhoea were often noticed when the teeth appeared at the gums, and to subside when they made their exit, the theory was not unfounded.

Aside from this, there is a more abiding predisposition to its occurrence, in that the whole digestive visera are now undergoing a radical change, to fit them for new functions soon to be imposed by reason of the changed character of food to be supplied to the processes of life.

These new and unsuited articles of diet prematurely presented to the digestive system of the child are quite sufficient to institute diarrhoeal disturbances. But in addition to dentition and unsuitable food which predispose to entero-colitis, atmospheric conditions appear to wield important influences both in its causation and limitation. This applies to simple diarrhoea as well as dysenteries of children, as is seen, says West, from the record of "Children's Infirmary;" for in all cases of disease admitted there, diarrhoea formed in November, December and January, 7.9 per cent.; February, March and April, 9.5 per cent.; May, June and July, 15.3 per cent.; August, September and October, 23 per cent.

The New York Board of Health in a tabulated monthly report for 1882, of deaths from diarrhoea in children under five years of age, say that there were the following in

	Under 5 yrs.	Over 5 yrs.
January.....	34	14
February.....	32	15
March.....	50	14
April.....	50	20
May.....	72	15
June.....	231	19
July.....	1533	131
August.....	817	149
September.....	362	84
October.....	175	55
November.....	68	31
December.....	35	24

J. Lewis Smith, commenting upon these figures, observes that nine times as many children died under five years from diarrhoea during the time from June 1st to October 31st, as in the remaining seven months; also, that during these same five months, the number of deaths occurring among children under five years were seven and one-half times greater than the number over that age.

The same Board, in their annual report for 1870, remark: "The mortality from the diarrhoeal affections amounted to 2,789, or 33 per cent. of the total deaths. Of these, 95 per cent. occurred in children less than five years of age, 92 per cent. in children less than two years old, and 67 per cent. in those less than one year of age.

On examining the annual report of Health Officer Smith Townshend, M. D., for 1885, of Washington City, I find registered as having occurred from July 1, 1884, to June 30, 1885, 59 deaths from entero-colitis, and 206 from cholera infantum in months as follows:

	Entero- colitis.	Cholera Infantum.	Totals.
July	8	59	67
August	20	42	62
September	13	30	43
October	1	6	7
November	4	0	4
December	1	1	2
January	0	0	0
February	0	0	0
March	1	0	1
April	0	0	0
May	2	0	2
June	10	68	78
Total			264

Thus showing that for the four months of June, July, August and September, that 250 of the 264, or about eighteen times as many deaths occurred as during the remaining eight months of the year, which greater mortality corresponds with the highest thermal range. Of these deaths, there were among whites from cholera infantum, 113, and from entero-colitis, 25; colored,

from cholera infantum, 93, and from entero-colitis, 33. Total white, 138; total colored, 126; within 12 of the number of whites.

Remembering that the total population of Washington is 200,000—69,000 of whom are colored, or about one-third—we see that the death rate of the colored is about 50 per cent. greater than among the white population. This is a significant fact, and shows that other than thermal influences exert perhaps as great or greater power in determining the production of the disease.

There, as elsewhere, doubtless, the demon, poverty, with all its attending evils, afflicts the colored race more than any other class. Forced by this to retire to the more insalubrious portions of the city—to occupy indifferent, crowded and badly ventilated houses, among the lanes and alleys, where exists defective drainage and general atmospheric contaminations—poorly clad, insufficiently protected from the elements, subsisting upon ordinary and unsuited food, cursed by ignorance and indifference to all personal and home sanitation;—these, and other things useless to mention, should appear as potent factors in accounting for the excessive death rate of the negro as compared to the whites, in this disease as well as others.

So that while the heat of summer stands in close relation to the causation of entero-colitis, it is not directly so, and seems to exert its pernicious influence by setting in force the latent elements of disease, hidden away in especially portions of cities neglectful of sanitary science. If heat alone was the cause of this disease, then the country at large would be alike afflicted with cities, which, instead, is almost totally exempted. However, heat of summer, acting upon unsanitary and polluted portions of cities, hastening decomposition and the emission of obnoxious effluvia, becomes an active element in the production of diarrhœas of summer. J. Lewis Smith traced a simultaneous attack of diarrhœa in four children, of whom one died, to offensive emanations of a manure-pile near by, and also discovered at another time, that every infant between two avenues in New York had diarrhœa from being subjected to filthy surroundings. The population was densely packed into inadequate houses, occupants were ignorant, poor, dirty and were com-

compelled to inhale the effluvia from the slops of the kitchens, privy contents, which seeped from the walls and sidewalks, from numerous decaying animals, and offal from stables. He also relates the case of butchers who carried on a bone-boiling establishment at night, where gases therefrom were exceedingly offensive, and where summer complaint became prevalent and the lives of many children were sacrificed therefrom. He quotes Murchison as saying that twenty out of twenty-five boys were seized with vomiting and purging, from the inhalation from an old drain, near a school where they were confined. Various kinds of impurities, organic, inorganic and chemical, are known to exist in the air of cities, which exert a deleterious influence upon the health of the inhabitants. Micrococci, bacteria, spores, in all varieties, are now known to exist in multiplied millions, in the air, elsewhere as well as in cities, especially about sinks, sewers and low places. Baginsky even found bacilli in dejections and intestines of those who had died of cholera infantum.

FOOD AS A CAUSE OF ENTERO-COLITIS.

My observation leads me to believe that no young animal suffers more from ignorance, neglect and over-kindness than the babies of our country; as is shown often in feeding them. As a rule, as soon as born, and thence onward, they are indulged the breast till weaned, at each nursing their stomachs being filled to utmost repletion. Soon, perhaps the first day, it begins to throw up its contents, caused by excessive nursing. Guided alone by instinct in the gratification of its appetite and appreciating no rule by which to stop, save the sense of gastric fullness, and the mother acquiescing, instead of controlling the quantity the child should take. Soon the little fellow has a fit of indigestion, milk decomposes, gases evolve, stomach sickens, and it throws up.

Soon the same is repeated again and again, the bowels often become irritated—move, baby sucks, baby cries, baby takes soothing-syrup, paregoric, sucks, vomits, purges, and bye and bye the little fellow's teeth begin to come, is irritable, feverish. Mother gives more milk and paregoric, etc., not to cure, but to quiet it. This is the first year of baby's life. Often, unavoidably, it is placed upon the bottle, when the chances against its life are greatly increased by reason of the substitution of cow's

milk for its mother's. This milk being less suited to its digestive system, disagreeing with it, indigestion and diarrhœa result. Often fruits and candies, ordinary and unadaptable diet is forced upon it, while yet, physically, its bowels are unprepared for them, unable to digest its food; and thus the babies sicken, suffer and die of intero-colitis. At so early an age, all feculent food should be avoided. Milk is the only suitable article. It is now well understood and admitted that improper food, heat of summer, and over-crowding are conditions that produce diarrhœa. This was shown by Woodward during the late war among the soldiers; as well as by our former fellow-citizen, Joseph Jones, M. D., in his investigation into the causes of diarrhœa among the Federal prisoners at Andersonville and Camp Sumpter. These observations are confirmed by like occurrences, on the approach of and during the summer season among the prisoners in our jails, as witnessed by myself for the past four seasons.

MORBID ANATOMY.

It seems that enteritis alone has been rarely observed, while colitis by itself, or confined with enteritis, is common. Lagendre is quoted as having recorded that in twenty-eight cases of diarrhœa, he found the large intestines alone diseased in nine. The universal testimony of authors whom I have consulted is that while both the small and large are involved in the pathological process, it is more frequent in the large, and the portions thereof most affected in diarrhœa are the flexures and lower parts of the small intestines. In the acute form the mucous membrane is thickened and softened with an enlargement of the follicles, while in the chronic variety there is not only follicular engorgement, but thickening, induration and follicular ulceration. In the acute stage, hyperæmia of the mucous membrane may uniformly exist along the small bowels, which even extends to the peritoneal covering over the diseased centers. As a result of the inflammatory process, the walls of the intestines are not only thickened, but the mucous membrane may be so softened as that it is too delicate to be lifted up, even from its natural position, without being torn, and in other cases the sub mucous tissue seemed mostly disorganized, while the membrane with difficulty could be raised in strips.

In the course of entero-colitis the isolated glands appear in-

creased in size and more numerous than in health, seem as little grains, either projecting from or lying beneath the mucous membrane, their orifices tumid and darkened when open. Upon pressure a drop of pus is emitted. Peyer's patches present the same general appearance. In each little gland there is generally found to exist a minute little ulcer, from which discharges the products of inflammation. All the various stages of inflammation are found, from a mere congestion to an ulceration. Death may result before extensive ulceration has set up, by exhaustion or choleric diarrhoea, while in a state of enlargement. When, however, the case passes into the

CHRONIC FORM,

the ulcerations become more extensive, at which time the seat of the malady is confined principally to the large intestines. In this form of entero-colitis, the intestines are described as being thickened, indurated, contracted, with patches of discoloration in the peritoneal surface, and rigidity of walls, especially in colon and rectum. The ulcers, which are of follicular origin, are frequently about the size of a pin point, but often coalesce, extend and deepen to the sub-mucous or muscular coats, from which is discharged characteristic inflammatory products. Resulting from this pathological procedure, intussusception is sometimes found to exist, but is supposed to have taken place mostly from the act of dying. The mesenteric glands are nearly always found in a congested and enlarged condition, and the ones most affected are those sustaining the nearest proximity to diseased bowels, showing, in all probability, the results of septic absorption. The stomach generally is in a normal condition, rarely its mucous tissue is congested.

It was once generally believed that the liver was directly involved in the causation of entero-colitis, but recent observations seem to have disproven this hypothesis. In one batch of fourteen cases, where post-mortem examinations were made upon this point, as referred to by Meigs and Pepper, only one was affected, the liver being simply enlarged. In another of thirty-two cases, there was no evidence that the liver was congested, torpid, hyperactive or perverted in its secretions.

The brain, on examination, shows resultant, rather than causative, evidence of entero-colitis. In some cases cerebral symp-

toms are manifest during the progress of the disease, which, however, occurs, not in the acute, but protracted forms, when, from the general waste of the body, in which the brain likewise shares, there frequently appears an aqueous effusion within the cranium, over the brain, giving rise to what is denominated spurious hydrocephalus. By reason of the unequally resisting power of the walls of the cranium to the increasing pressure from within, the head appears uneven. This effusion is taken as evidence of general debility and indicative of a passive congestion of the veins and sinuses of the brain.

SYMPTOMS.

Summer complaint often develops gradually from a simple looseness of the bowels, but in most cases from the beginning, a more serious character than those of simple diarrhœa, together with systemic disturbance, is present. When the onset is sudden, it often begins with vomiting, which may continue twelve or twenty-four hours, with irritability of stomach so extreme that every particle of fluid or food is immediately rejected. This symptom usually sets in about the close of the first week. Relaxation of bowels may co-exist with vomiting, and the patient have two or three dozen alvine discharges inside of twenty-four hours. Stools first fecal, soon become slimy, streaked with blood, often expelled with violence and cries. They become scanty, thin, yellow, brown, with or without blood or mucous, and gush without effort. Often, however, the child suddenly and in agony cries when the bowels move, and mucous streaked with blood is found in the stools, indicating inflammatory action in the colon. With such an attack constitutional symptoms are generally very severe. The skin is dry, hot, and pulse accelerated to 120 to 150 per minute; temperature, 103° to 107° . The case being protracted the vitality becomes depressed, face and extremities cool and pallid, the pulse more frequent, the skin remains dry and the kidneys act imperfectly. The child is fretful and irritable, especially when approached; when left alone, lies drowsily on the pillow, with eyes half open, white and glistening; when aroused, cries and squirms. Excitement alternates with stupor; muscular agitations and threatened convulsions, which sometimes occur, are the usual characteristics. The mind is usually clear when aroused from stupor. The

bowels are generally full and tympanitic without especial tenderness. The tongue is generally about normal in appearance at first, which is moist and presenting a light, mucous fur; afterwards, often becomes a bright red, extending especially to the tip and edges. Disease continuing, becomes redder and dryer, especially during the fever, which exists in all acute cases in varying degrees.

The appetite is absent and thirst is intense; when indulged with water drinks heartily, and when the cup is withdrawn cries for more, but soon rejects what it has taken. The child emaciates, and may, within a few days, be reduced from one of strength and vigor to extreme debility. The countenance becomes haggard and sunken, the flesh flabby and hangs in folds upon the bones, the eyes are sunken and weak and a dark bluish circle surrounds them, and as said, "the child seems one of misery and exhaustion."

The duration of the disease is variable and uncertain. It may continue for a few days, few weeks, or for the entire summer. It may end in the chronic form, or by cholera infantum suddenly intervening, from which it may either recover or die. The chronic form of entero-colitis may follow the acute form, from which it differs principally in that it is characterized by a much lighter fever and other modified constitutional symptoms in its early stage: the diarrhoea is milder and less abundant; the encroachments of the disease are more tardy; the loss of flesh goes on daily, slowly but surely; the appetite is variable and sometimes disappears entirely; likewise the thirst and nausea is provoked by everything the child takes: oedematous effusion occurs often in the face, hands and feet; tongue becomes red, dry, and thrush appears upon it, mouth, throat and fauces; the evacuations, which are not so frequent as in the acute form, are green, watery and of variable consistency of slime, blood and pus; the odor is quite offensive at times and at times absent; the body is reduced and the feet and hands are generally cold. A slight aggravation of the diarrhoea during this condition is quite sufficient to close the life of the victim. Emaciation continuing, the child may die from exhaustion, or, after long prostration, return slowly to health.

By reason of the reduction of its vitality, from continued drain upon the system, intercurrent affections, such as bron-

chitis and pneumonia of the hypostatic variety, often develop and escape for a time the observation of the physician. The disease intermits and remits; the child now improves, now relapses into its former condition. The alvine discharges, which are uniformly viciously acid in character, irritate the skin about the anus, buttocks and legs, produces in many cases an erythematous rash and feruncles, the latter also appearing on scalp, forehead and face. When spurious hydrocephalus occurs, it is announced by vomiting, rolling the head, drowsiness, contracted and insensible pupils, which, as stupor increases, remain permanently contracted. The surfaces are dry, while the pulse rate increases and the strokes grow feebler. Patient may recover but generally dies.

DIAGNOSIS.

The usual symptoms of entero-colitis as detailed above, and the history of the diarrhoea renders the diagnosis easy. The secondary or chronic form can only possibly be confounded with tubercular diarrhoea, which confusion can be avoided by ascertaining whether or not there is evidence of such disease in other organs.

PROGNOSIS.

Notwithstanding entero-colitis during hot weather adds greatly to the death list, most cases are cured when proper attention is given to sanitary surroundings and judicious medical treatment. Cholera infantum, which is regarded as the most dangerous form of this complaint, may suddenly intervene, upon either the short or protracted cases, when, of course, the prognosis is less favorable. But, with this exception, death is only likely to occur after a lingering illness, during which time patient may be reduced to a bare skeleton, unable to lift the head from its pillow for weeks, scarcely able to cry audibly. Even such cases get well.

TREATMENT.

Statistics and facts pertaining to this disease clearly show that in a large measure it is produced, modified, cured and prevented by the surroundings and diet of the patient. Therefore, it addresses itself especially to scientific and practical sanitation. It especially comes under the jurisdiction of the health officers of the country, who, if warmly and fully supported by the intelli-

gence and wisdom of our profession, and armed by proper medical legislation, would be enabled to practically demonstrate to the good of humanity the truthfulness of the teachings of physicians and sanitarians, that "an ounce of prevention is worth a pound of cure," by enforcing rigid disciplinary sanitation, as to all cities, localities, and dietary also, whenever needed. Facts and authorities herein referred to, as well as many others, show that improper environments, bad air, poorly ventilated and dilapidated houses, defective drainage, residences in low and unsanitary localities, consumption of unsuited diet, neglect of personal cleanliness, are the conditions from which arise the diarrhoea of children. These conditions could be largely remedied, and the death rate greatly reduced, if by the arm of the law we could set in force the principles of sanitation, which we as medical men know would redeem the sufferers. The medical profession now is all aglow with the spirit of preventive medicine, and we hope to see ere long, by still more enlightening the masses upon the subject, that legislators will give heed to the admonition of scientists, by enacting wholesome laws for the sanitation of the people. Health boards and health officers should have the legal authority to condemn houses, business, water and food (the latter often adulterated and tainted as already found), whenever discovered to exist detrimentally to public health. The fact that patients find respite and restoration to health by removal from the polluted atmosphere and dietetic surroundings of cities, to the clear, pure, cool air of the country, shows what might be accomplished by more attention to and closer compliance with sanitary regulations. Habitation, therefore, is one of the essential elements, not only in the consideration of the disease, but in the treatment also, whether in urban or rural districts. As Brunton says, prophylaxis or preventive medicine is becoming more popular every day, and the probability is, before this century closes, physicians will be employed rather to prevent disease than to cure it. The progress of this department has been greatly aided by developments in the life history of micro-organisms in the production of disease, and our ability to prevent disease will grow as we ascertain the drugs which will destroy their being.

More intelligence and attention among parents, as to food, atmosphere, clothing and habitation for their children, remember-

ing that they are only instinctive in all they do, would rid them of much untold suffering, disease and death. Though, however good these may be, in many cases under the depressing influence of excessive heat and unknown agencies, restoration to health is only reasonably assured by removal to the country until fall, when its invigorating and reduced temperature brings safety to the patient.

The successful management of children under five years, and especially under two years of age, mostly depends upon the character and quantity of food with which they are supplied. The census reports of 1880 for New York and Pennsylvania show that 35,377 died under one year, 6,031 during the second, and 4,139 during the third year of their ages. As we know the chief fatal disease among children is diarrhoea, a controlling cause of which is error of diet, we can but see the great importance of the subject of food.

It is attributed to Disraeli, that he said "mother's milk makes the true-born Englishman." Unquestionably mothers' milk is the proper food for infants, to which we all agree. If not the mother's, a woman's milk; if not woman's, then cow's milk, slightly altered, so as to imitate human milk. From two to four parts of pure water added, with a little sugar, is a recognized mode. Diarrhoea is often produced by *fermentation* and *mechanical* irritation of undigested curd, as maintained by Keating, and known by us all. This results often from improper preparation of the food, as well as deficiency of gastric juice. Cow's milk should be boiled and pepsin and hydrochloric acid administered to correct these, thus rendering the milk anti-putrefactive and digestive. If an excess of acid exists in the stomach of the child, or the natural acidity of cow's milk, (Keating) lime-water, soda or potash may be added. "Baby foods," of which there are many prepared, I trust will be discussed by the Academy, as time forbids me.

MEDICAL TREATMENT

varies according to the stage of disease and condition of patient. Our object is to check the diarrhoea and support the patient. Beginning, remove all irritating substances from bowels by castor oil or sulph. magnesia. Early stage, calomel has long been held in repute, given in small doses with carb. soda and ipecac, after

the prescription of Dr. Chambers, of London. Parvules of calomel, 1-20 grain every hour, till a dozen are taken, are beneficial. Both calomel and corrosive sublimate are recognized as curative in this disease. How? Brunton says by antiseptic properties and power of arresting decomposition, as shown by Wassilieff, due to low organisms. If the position of Baginsky and other micrologists be true, that he has demonstrated the existence of bacilli, not only in the dejections and mucous membranes of the intestines of those who died of cholera infantum in large quantities, but also wandering in the sub-mucous tissue, then there are cogent reasons why the practice is good. In 1870 Dougall discovered one part of cor. sub. to 6,500 parts of water would kill spermatozoa; one part in 6,000 kill infusoria. Later, Koch, Croix, Sternburg, of the U. S. A., and others have shown it to be the most powerful germicide. Micrococci, bacilli in active growth are killed by a solution of one part in 2,000, while one in 1,000 will rapidly destroy the anthrax bacilli. These observations being true, it matters not whether the bacilli are the pathogeny of entero-colitis or that they come into existence as a result of putrid secretion and decomposition of fecal matter, the use of disinfectant medicine would be rational. *Opium*, I regard as the Ajax of the materia medica in the treatment of diarrhœa. Given in the form of Dover's powders, deodorized tr. of opium, laudanum or paregoric.

Sub. nitr. of bismuth is valuable. It is a local sedative, diminishing the irritability of mucous membrane. It is the best anti-emetic, relieves nausea. Combined with lime, chalk, pul. cinnamon or alkalies, is valuable. Woodward found it, in the army, most valuable in both the simple irritation and chronic diarrhœa. Acetate of lead and nitrate silver are useful. Revulsives, poultices, stimulants and tonics, and especially sul. quinine, (as a tonic) are of great value. The closest attention should be given to diet in the chronic as well as the acute form of entero-colitis. Beef tea, chicken tea, prepared cow's milk or woman's milk, preferably, should form the chief dietary. Raw beef, to be sucked and eaten by the child, is advised upon high authority. Nitrate of iron, sul. zinc, sul. copper, tannin, sulphuric acid, tr. chloride of iron, acetic acid, liquor acetate of ammonia, during the progress of the disease, are standard and valuable remedies in appropriate doses and conditions.

CHOLERA INFANTUM

is regarded as the most violent inflammatory form of entero-colitis. Though vastly important to our discussion, the length of this paper and lack of time prevents me considering it on this occasion. Suffice it to say, it may come as a sequel to chronic cases of entero-colitis, or suddenly attack the patient with violent vomiting, and diarrhoea, watery, stainless and copious and painful stools, colliquative perspiration, cold skin, sunken eyes, contracted, pinched features, presenting all the appearances of Asiatic cholera, with extreme collapse, upon which supervenes death, often in twelve to twenty-four hours; or, not proceeding to such extent, may, under proper treatment, return to chronic form, and at last recover.

NASHVILLE, TENN., July 20, 1886.



